



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,957	01/30/2002	Masakuni Ezumi	648.41112X00	4627

20457 7590 02/24/2003

ANTONELLI TERRY STOUT AND KRAUS
SUITE 1800
1300 NORTH SEVENTEENTH STREET
ARLINGTON, VA 22209

EXAMINER

PITTMAN, ZIDIA T.

ART UNIT	PAPER NUMBER
----------	--------------

1725

DATE MAILED: 02/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/058,957

Applicant(s)

EZUMI ET AL.

Examiner

Zidia Pittman

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 10-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-87 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,4 6) ☐ Other: _____

DETAILED ACTION

Species Election

Restriction to one of the following inventions is required under 35 U.S.C. 121:

This application contains claims directed to the following patentably distinct species of the claimed invention:

Species I: Claims 1-9, drawn to a friction stir welding method, including retreating a rotary tool from members being welded when moving along a joint line.

Species II: Claims 10 and 11, drawn to a friction stir welding method, including relatively moving a rotary tool against a joint line based on data stored in advance.

Species III: Claims 12-15, drawn to a friction stir welding method, including fillet welding the end portion of the second member along the projection.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Bill Solomon on January 29, 2003 a provisional election was made with traverse to prosecute the invention of I, claims 1-9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-0-15 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Koga et al (JP 2000 135577 A).

Koga et al teaches a friction stir welding method including retreating a rotary tool from members to be welded, changing the direction of the rotary tool by retreating tool and rotating support device for rotary tool in order to vary the tilt angle, reinserting the rotary tool at about the same position as where retreated, moving the rotary tool along a new joint line, and wherein tilt angle of rotary tool is varied with retreating position and/or tip of rotary tool set as reference. (paragraphs 0018-0021)

Claims 1, 3, and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Ezumi et al (USPN 6,273,323).

Ezumi et al teaches a manufacturing method of a structural body. The welding joint of the extruded frame members has a welding line having a start end and a finish end in the window. (col. 4, l. 35-38) When the respective rotary tools are inserted to a

Art Unit: 1725

predetermined depth into the surface of the respective hollow-extruded members, the movement of the gantry, which carries plural friction stir welding apparatuses, is started to carry the welding apparatuses toward the other end, so that friction stir welding is carried out. (col. 5, l. 23-28) When the friction stir welding has advanced from the end portion of the extruded frame member to a point where the rotary tools reach the position of the extending portions at the window, while continuing the rotation of the rotary tool, the rotary tool is withdrawn from the welding joint. (col. 5, l. 39-44) When the rotary tool reaches the predetermined position, the raising of the rotary tool and the rotation thereof are stopped. At this point, the rotary tool has been elevated sufficiently that it is carried at a level about the surface of the raised portions. When the small diameter of the rotary has been pulled entirely out (withdrawn) of the raised portions, the friction stir welding is stopped along the welding line. When the rotary tools reach the other end of the window, namely to a predetermined position, which is this side of the extending portions, a raising (withdrawal) of the rotary tools starts. (col. 5, l. 65 – col. 6, l. 9) Next, at the (specified) position, all rotary tools are made to rotate and descend, and the rotary tools are inserted into the welding joints to a predetermined depth. (col. 6, l. 34-37) The rotary tools are inserted into the above-stated holes. Since the insertion amount of the rotary tool is the regular depth, the insertion depth is the same as it was before the position (the insertion depth before the starting of the raising of the rotary tool). Namely, at the (specified) position, the depth is the same as it was before the friction stir welding was stopped and plus 0.5 mm. With this, from the lowest end portion of the above-stated hole which was generated just before the rotary tool

Art Unit: 1725

was pulled out, the rotary tool is inserted deeply with an additional 0.5 mm. (col. 6, l. 40-49)

With respect to the limitation requiring changing the direction of the rotary tool or members to be welded, the examiner refers to Figure 1 (C) with regards to position P4. As seen in the figure, a vertical change in direction is demonstrated (moving the rotary tool vertically up, then vertically down), which the examiner relates to the previously stated limitation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

Art Unit: 1725

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ezumi et al (USPN 6,273,323) in view of Thomas et al (USPN 5,460,317).

Ezumi et al teaches all the limitations of claim 8 as recited above for claim 1, except for teaching wherein retreating of the rotary tool is performed after stopping the movement of the rotary tool.

Thomas et al teaches friction welding. A method of operating on a workpiece comprises offering a probe of material harder than the workpiece material to a continuous surface of the workpiece causing relative cyclic movement between the probe and workpiece while urging the probe and workpiece together whereby frictional heat is generated as the probe enters the workpiece so as to create a plasticized region in the workpiece material around the probe, stopping the relative cyclic movement, and allowing the plasticized material to solidify around the probe. (abstract) It would have been obvious to one having ordinary skill in the art that the probe has to be removed from the workpiece to complete the welding process.

At the time of the invention, it would have been obvious to one having ordinary skill in the art to modify the teachings of Ezumi et al with the teachings of Thomas et al as a conventional means of removing the tool from the components to be welded when friction stir welding.

Allowable Subject Matter

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or suggest the friction stir method as recited, particularly wherein the direction is changed by retreating the tool and then rotating the members being welded, thereby varying the tilt angle of the rotary tool against the direction of movement thereof.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ezumi et al (USPN 6,502,739), Ezumi et al (USPN 6,474,533), Aota et al (USPN 6,419,144), Aota et al (USPN 6,382,498), Aota et al (USPN 6,378,754), Ezumi et al (USPN 6,354,483), Ezumi et al (USPN 6,325,274), Satou et al (USPN 6,315,187), Aota et al (USPN 6,305,866), Thompson (USPN 6,302,315), Aota et al (USPN 6,237,829), Waldron et al (USPN 6,168,067), Talwar et al (USPN 6,051,325), Aota et al (USPN 6,050,474), Martin et al (USPN 6,045,028), Midling et al (USPN 5,813,592), Colligan (USPN 5,718,366), Bampton (USPN 5,697,511), Woerner et al (USPN 5,603,448), Thomas et al (USPN 5,460,317), Ezumi et al (USPN 6,502,739), Hoedl (USPN 5,298,098), Koga et al (JP 2000135576 A), and Koga et al (JP 2000135575) are cited as of interest.


Art Unit: 1725

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zidia Pittman whose telephone number is (703) 305-1248. The examiner can normally be reached on Monday – Thursday and alternate Fridays from 8:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn, can be reached at (703) 308-3318. The official fax phone number for the organization where this application or proceeding is assigned is (703) 305-7718. The unofficial fax number for art unit 1725 is (703) 305-6078.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

TD
02/06/03


TOM DUNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700